Chapter

6

DEVELOPMENT ALTERNATIVES

Chapter

6

DEVELOPMENT ALTERNATIVES

for the Airport Master Plan and Environmental Assessment for the San Carlos Apache Airport

6.0 INTRODUCTION

The preceding discussion of facility needs provides the basis for developing alternative expansion concepts. The Facility Requirements Chapter provided recommended development for the majority of needs for the existing or some future airport for the Globe/Miami/San Carlos Area. This Chapter will focus on the logical alternatives that the Airport Planning Committee and the San Carlos Apache Tribe should consider for the existing and future aviation needs of the region. As discussed in Chapter V, "Facility Requirements", Runway 9/27's length is less than the recommended length for the design aircraft. Chapter V also pointed out that the existing runway is in need of extensive rehabilitation as are the majority of landside facilities presently located at the airport. This feasibility study has identified six general alternatives in addition to the "Do nothing" alternative, which to an extent, could provide aviation facilities in the area. Figures depicting the alternatives presented in Alternatives "1,2,3, and 4" are located at the end of this chapter. The alternatives include:

0) Maintain the airport as it presently exists. ("Do nothing" alternative)
1) Rehabilitate the existing Runway 9/27.
2) Rehabilitate the existing Runway 9/27; extend Runway 9/27 and Parallel Taxiway.
3) Construct a new runway which meets FAA guidelines for aircraft having an ARC of C-II.
4) Rehabilitate and extend the existing Runway 9/27; construct a new full length Parallel Taxiway with 300' Runway/Taxiway separation.
5) Develop a new airport site.
6) Provide service from another airport in the region.

The following narrative concentrates on the development of facilities needed to meet the existing and future demand from general aviation aircraft. Associated preliminary cost estimates for each alternative have also been provided as part of this Chapter. Land acquisition costs and relocation expenses have not been included. Since the airport is located on the San Carlos Apache Reservation, land acquisition costs are not applicable. Additionally, this section has not included the usual maintenance cost associated with maintaining the existing or future facility.

6.1 ALTERNATIVE "0"

Maintain the airport as it presently exists.

The airport is unique for the area in that it serves a number of business turboprop and turbojet aircraft, as well as moderate recreational single-engine aircraft activity. These aircraft operations occur on a regular and consistent basis and are projected to continue for the foreseeable future. The existing runway length is insufficient to accommodate the existing aircraft fleet. This alternative will not accomplish the community's desire to attract and accommodate the design aircraft fleet in an effort to attract economic development and business opportunities to the community and the entire region. Also important to the continued growth of the area are the recreational and tourism interests and the need to provide a facility to serve those needs.

The major advantages to this alternative are:

- Reduces the amount of funding by the San Carlos Apache Tribe for the airport, since no major capital improvement projects would occur.
- Eliminates the potential environmental impacts associated with airport development.

The major disadvantages to this alternative are:

- Increases the amount of funding that San Carlos Apache Tribe will need for operating and maintenance costs at the facility.
- Since pavements may not be maintained appropriately, it may increase the liability to the San Carlos Apache Tribe as a result of a stronger potential for mishaps occurring at the airport.
- Does nothing to reduce nonstandard conditions presently found at the airport, which include insufficient runway to taxiway centerline separation, and penetrations to the Runway Object Free Area and Safety Areas.
- Significantly reduces the ability of the San Carlos Apache Airport to meet the present and future demand by the aviation users of the region.

6.2 ALTERNATIVE "1"

Rehabilitate the existing Runway 9/27.

This alternative would rehabilitate the existing runway pavements and lighting system at the San Carlos Apache Airport. This alternative would not meet FAA standards for the existing design aircraft which has an Airport Reference Code (ARC) of B-II, nor for the future design aircraft which has an ARC of C-II. These nonstandard conditions include: insufficient runway to taxiway centerline separation, and penetrations to the Runway Object Free Area and Safety Areas. Also, sufficient runway length for the design aircraft fleet would not be provided.

The major advantages to this alternative are:

- No additional land would be needed from the San Carlos Indian Reservation.
- Part 77 Approach Surfaces would not be penetrated by obstructions.
- Provides a level area suitable for aircraft operations.
- Provides an airport location within close proximity to the communities of Globe, Miami, and San Carlos.

The major disadvantages to this alternative are:

- Provides a runway with a significantly shorter length than recommended.
- Does nothing to reduce nonstandard conditions presently found at the airport, which include insufficient runway to taxiway centerline separation, and penetrations to the Runway Object Free Area and Safety Areas.

6.3 ALTERNATIVE "2"

Rehabilitate and extend the existing Runway 9/27.

This alternative would rehabilitate the existing runway pavements and lighting system, extend the existing runway to 6,500 feet, and strengthen and extend the existing parallel taxiway at the San Carlos Apache Airport. This alternative would not meet FAA standards for the existing design aircraft which has an Airport Reference Code (ARC) of B-II, nor for the future design aircraft which has an ARC of C-II. These nonstandard conditions include: insufficient runway to taxiway centerline separation, and penetrations to the Runway Object Free Area and Safety Areas. This alternative would provide sufficient runway length for the design aircraft fleet.

The major advantages for this alternative are:

- Part 77 Approach Surfaces would not be penetrated by obstructions.
- Provides a level area suitable for aircraft operations.
- Provides an airport location within close proximity to the communities of Globe, Miami, and San Carlos.
- Provides a suitable length for turboprop and turbojet aircraft presently using, and forecasted to use the airport. This runway would significantly reduce the weight limitation which some aircraft have with the existing runway length. An ultimate runway length of 8,500 feet will meet the requirements for the entire critical aircraft fleet.
- Corrects penetrations to the Runway Object Free Area and Safety Areas.

The major disadvantages to this alternative are:

- Requires significant capital expense without correcting all nonstandard conditions presently found at the airport.
- Will require a significant amount of site preparation including drainage work for the runway and taxiway extension.
- Does not correct insufficient runway to taxiway centerline separation.

6.4 ALTERNATIVE "3"

Construct a new runway at the existing airport, which meets FAA guidelines for aircraft having an ARC of C-II.

This alternative would involve the construction of a new Runway 9/27. This runway would be initially constructed to a length of 6,500 feet by 100 feet wide within the first five years of this study period. . The runway could then be extended to 8,500 feet. The parallel taxiway would be strengthened and extended to equal the strength and length of the runway. This alternative would meet or exceed the FAA's recommendation that airports have an overall crosswind coverage of 95 percent or higher for aircraft capable of handling a crosswind component of 13 knots. This alternative requires the use of approximately 120 additional acres of Reservation land for airport purposes.

The major advantages to this alternative are:

- Provides a runway which meets FAA criteria and would be a cost effective alternative to completing a major reconstruction project to the existing runway.
- Corrects nonstandard conditions which occur with the existing runway.
- Provides a suitable length for turboprop and turbojet aircraft presently using the airport. This runway would significantly reduce the weight limitation which some aircraft have with the existing runway length. An ultimate runway length of 8,500 feet will meet the requirements for the entire critical aircraft fleet.
- Part 77 Primary and Approach Surfaces would not be penetrated by obstructions.
- Eliminates the ROFA and RSA penetrations to the west of Runway 9/27.
- Provides a level area suitable for aircraft operations.
- Provides an airport location within close proximity to the Communities of Globe, Miami and San Carlos.

The major disadvantages to this alternative are:

- Will require a significant amount of site preparation including drainage work before a new runway can be constructed.
- The ultimate runway length of 8,550 feet is less than the recommended 10,860 feet required for 100 percent of larger aircraft (those aircraft weighing less than 60,000 pounds) at 90 percent of their useful takeoff weight. However, this length should be considered adequate considering the length of haul for aircraft using the San Carlos Apache Airport. A shorter length of haul requires less fuel and as a result aircraft departing San Carlos Apache Airport do not usually require that their fuel tanks be completely full; thus reducing the takeoff weight of the aircraft; and
- Will require additional construction to connect the new runway to the existing taxiway system.

6.5 ALTERNATIVE "4"

Rehabilitate and extend existing Runway 9/27; and construct a new full length Parallel Taxiway with 300' Runway/Taxiway separation.

This alternative would involve the construction of a new full length parallel taxiway with 300 feet runway/taxiway separation; and the rehabilitation and extension of the existing runway pavements and lighting system. This alternative would correct the nonstandard conditions presently found at the airport. The new parallel taxiway would be located 100 feet to the north of the existing parallel taxiway.

The major advantages to this alternative are:

- Provides a runway which meets FAA criteria.
- Corrects nonstandard conditions which occur with the existing runway.
- Provides a suitable length for turboprop and turbojet aircraft presently using the airport. This runway would significantly reduce the weight limitation which some aircraft have with the existing runway length. An ultimate runway length of 8,500 feet will meet the requirements of the entire critical aircraft fleet.
- Part 77 Primary and Approach Surfaces would not be penetrated by obstructions.
- Eliminates the ROFA and RSA penetrations to the west of Runway 9/27.
- Provides a level area suitable for aircraft operations.
- Provides an airport location within close proximity to the Communities of Globe, Miami, and San Carlos.

The major disadvantages to this alternative are:

- Will require a significant amount of site preparation including drainage work for the runway and taxiway extension.
- Is not a cost effective solution since a major rehabilitation of the existing runway would still be required.
- New taxiway eliminates approximately 5,000 S.Y. of existing aircraft parking apron which should be replaced.

6.6 ALTERNATIVE "5"

Develop New Airport Site

This alternative would allow the San Carlos Apache Tribe to consider the possible relocation of the San Carlos Apache Airport to a location which would meet FAA recommendations for aircraft having an ARC of C-II. The existing San Carlos Apache Airport would be closed if this alternative were chosen. A new airport would require the construction of needed infrastructure such as utility lines and access roads to the selected site. At the minimum, approximately 180 acres would need to be acquired to construct a runway/taxiway system which would have an initial length of 6,500 feet along with aircraft parking aprons, T-Hangar and conventional hangar development, and an FBO/Executive Terminal facility. Approximately 60 additional acres would need to be acquired for an ultimate runway length of 8,500 feet.

Normally the construction of a new runway is completed in a phased development, with the initial runway length being 6,500 feet and the final phase of development

being the construction of an additional 2,000 feet. Initially, only a runway would be constructed, with the addition of a full length parallel taxiway when demand warrants. Existing airfield pavements at the San Carlos Apache Airport could be rotomilled and used as base course for the parallel taxiway. This would aid in reducing the loss of existing capital investment at the San Carlos Apache Airport.

The estimated costs for this alternative are based on a hypothetical site which meets grading criteria, crosswind coverage, proximity to the business district, environmental considerations, and FAR Part 77 criteria. A Site Selection Study of several potential sites would be required should this option be implemented.

The major advantages to this alternative are:

- There may be several areas on the San Carlos Apache Reservation which could provide an airport site which would allow *unencumbered* development to meet the recommendations as set forth by the FAA.
- Existing airside and landside facilities at the San Carlos Apache Airport are in need of extensive repair and/or demolition /reconstruction.
- A new site would provide a runway length that meets the minimum recommendations of 6,500 feet, and which could be extended to 8,500 feet as an ultimate length.

The major disadvantages to this alternative are:

- Approximately 250 acres of additional Reservation land would be converted to airport use.
- Possible prolonged negotiations for utility and access easements, land use conversion, and environmental studies.
- Economic impact from the Apache Gold Casino decreases as the distance to the new airport location increases. Currently, the airport is in very close proximity to the Casino.
- The loss of the capital investment (if any) at the existing San Carlos Apache Airport.

6.7 ALTERNATIVE "6"

Provide service from another airport in the region.

The San Carlos Apache Airport was constructed primarily to serve general aviation interests and business aviation needs of Gila County, the communities of Globe and Miami, the San Carlos Reservation, and the surrounding region. The alternative of providing aviation services at another airport is considered impractical due to the lack of other airports close enough to Globe-San Carlos which possess adequate facilities to meet the aviation demands of the area. The nearest airports, providing facilities to accommodate the aircraft activity that takes place at the San Carlos Apache Airport are located at Phoenix, Arizona, (87 surface miles away) and Superior, Arizona (24 surface miles away). Both airports are outside of Gila County and do not serve the goals of the communities concerned.

Providing service from another airport would not be economical or feasible. Service from these locations would result in increased time, energy, and additional travel expense to aviation users that would otherwise be unnecessary. This alternative ignores the existing problem of providing safe and efficient service to the aviation activity of Gila County and the greater Globe/Miami/San Carlos area.

6.8 ALTERNATIVE DEVELOPMENT ENGINEER'S COST ESTIMATES

The following tables outline the comparative costs for constructing each alternative concept. Cost estimates for Alternatives 0 and 6 have not been included since both alternatives would not require any additional capital outlay by the airport sponsor or the FAA. The FAA provides 91.06 percent funding for eligible airport development projects in Arizona. The State of Arizona currently does not participate in funding airport development projects on Indian Reservations. Legislation is being pursued to change this statute and allow for State participation in these projects. A more in-depth cost analysis of the "Preferred" alternative is included in the Capital Improvement Plan in Chapter IX.

TABLE VI-1
ALTERNATIVE "1"
REHABILITATE THE EXISTING RUNWAY 9/27

Description	TotalCost	FederalShare	Sponsor Share
Rehabilitate Existing Runway 09/27	$2,946,800	$2,683,356	$263,444
Strengthen Parallel Taxiway to 60,000 lbs DWG	398,500	362,874	35,626
Light & Sign Runway 09/27 & Parallel Taxiway	214,800	195,597	19,203
Install PAPIs & REILs Both Ends Runway 09/27	158,400	144,239	14,161
Install AWOS	90,000	81,954	8,046
Expand Aircraft Parking Apron	246,000	224,008	21,992
Construct Taxilanes for T-Hangar Devlopment	153,600	139,868	13,732
TOTAL COSTS	**$4,208,100**	**$3,831,896**	**$376,204**

TABLE VI-2
ALTERNATIVE "2"
REHABILITATE EXISTING RUNWAY, STRENGTHEN EXISTING TAXIWAY, AND EXTEND RUNWAY AND TAXIWAY TO 6,500'

Description	TotalCost	FederalShare	Sponsor Share
Rehabilitate Existing Runway 9/27, Strengthen Existing Taxiway (From Table VI-1)	$4,208,100	$3,831,896	$376,204
Excavation for Runway & Taxiway Extension (Relocate drainage wash)	1,000,000	910,600	89,400
Extend Runway to 6,500'	483,600	440,366	43,234
Extend Taxiway by Approximately 750'	199,800	181,938	17,862
Install Wildlife/Secuity Fencing	35,000	31,871	3,129
TOTAL COSTS	**$5,926,500**	**$5,396,671**	**$529,829**

TABLE VI-3
ALTERNATIVE "3"
CONSTRUCT A NEW RUNWAY (100'x 6,500') WHICH MEETS FAA GUIDELINES FOR AIRCRAFT HAVING AN ARC OF C-II

Description	TotalCost	FederalShare	Sponsor Share
Site Prep for New Runway 09/27	$1,186,200	$1,080,154	$106,046
Install Wildlife/Security Fencing	168,000	152,981	15,019
Pave New Runway (100'x 6500') @ 60,000 lbs. DWG	3,252,600	2,961,818	290,782
Light & Sign New Runway 09/27	214,800	195,597	19,203
Install PAPIs & REILs @ Both Ends of Runway 9/27	158,400	144,239	14,161
Construct Bypass Taxiways @ Both Ends of New Runway 09/27	237,600	216,359	21,241
Strengthen Parallel Taxiway to 60,000 lbs. DWG	398,500	362,874	35,626
Expand Aircraft Parking Apron	246,000	224,008	21,992
Construct Taxilanes for T-Hangar Devlopment	153,600	139,868	13,732
Install AWOS	90,000	81,954	8,046
Extend Parallel Taxiway by Approximately 750'	199,800	181,938	17,862
TOTAL	**$6,305,500**	**$5,741,788**	**$563,712**

TABLE VI-4
ALTERNATIVE "4"
REHABILITATE & EXTEND EXISTING RUNWAY TO 6,500', AND CONSTRUCT NEW 6,500' PARALLEL TAXIWAY WITH 300' RUNWAY/TAXIWAY SEPARATION

Description	TotalCost	FederalShare	Sponsor Share
Rehabilitate Existing Runway 9/27	$2,946,800	$2,683,356	$263,444
Construct New Parallel Taxiway (35'x6,500') @ 60,000 lbs DWG	1,618,800	1,474,079	144,721
Construct Replacement Apron	246,000	224,008	21,992
Install Wildlife/Security Fencing	168,000	152,981	15,019
Light & Sign Runway 9/27 & Parallel Taxiway	214,800	195,597	19,203
Excavation for Runway & Taxiway Extension (Relocate drainage wash)	1,000,000	910,600	89,400
Extend Runway to 6,500'	483,600	440,366	43,234
Install PAPIs & REILs Both Ends Runway 9/27	158,400	144,239	14,161
Install AWOS	90,000	81,954	8,046
Expand Aircraft Parking Apron	246,000	224,008	21,992
Construct Taxilanes for T-Hangar Devlopment	153,600	139,868	13,732
TOTAL COSTS	**$7,326,000**	**$6,671,056**	**$654,944**

TABLE VI-5
ALTERNATIVE "5"
CONSTRUCT NEW AIRPORT SITE HAVING A RUNWAY 100'X 6,500'

Description	TotalCost	FederalShare	Sponsor Share
Crack & Fog Seal Existing Airfield Pavements	$64,000	$58,278	$5,722
Site Selection Study	50,000	45,530	4,470
EA for New Airport	50,000	45,530	4,470
Convert Approximately 250 Acres of Land to Airport Use	0	0	0
Construct Access Road	282,100	256,880	25,220
Site Prep for New Runway (100'x 6,500')	5,644,700	5,140,064	504,636
Install Perimeter Fencing	235,000	213,991	21,009
Pave New Runway (100'x 6,500')	3,252,600	2,961,818	290,782
Construct Holding Bays @ Both Ends of New Runway	237,600	216,359	21,241
Construct Aircraft Parking Apron	866,500	789,035	77,465
Install Runway Lights & Signage	209,400	190,680	18,720
Install AWOS	90,000	81,954	8,046
Install PAPIs & REILs @ Both Ends of New Runway	158,400	144,239	14,161
Construct FBO/Hangar/Pilots Lounge*	100,000		
Construct 10 T-Hangars*	250,000		
Site Prep for Full-Length Parallel Taxiway	1,962,500	1,787,053	175,448
Pave New Parallel Taxiway	1,895,800	1,726,315	169,485
TOTAL COSTS	**$15,348,600**	**$13,976,435**	**$1,372,165**

* *Typically, FBO facilities and hangars are financed by the FBO or privately with some form of agreement with the airport sponsor.*

6.9 SUMMARY

The San Carlos Apache Airport is a general aviation facility serving the aviation needs of Gila County, the Globe/Miami region, and the San Carlos Apache Reservation. The demands being placed on the airport are creating a need for safer and more efficient facilities for its users. The most pressing need for the airport is to meet FAA Safety and Design Standards, and to increase the runway length to accommodate the current fleet mix of aircraft, including single and multi-engine piston aircraft, and turboprop and turbojet aircraft. A future runway length of 6,500 feet and an ultimate runway length of 8,500 feet are recommended to meet this need. A runway/taxiway separation of 300 feet and adequate safety areas are required to meet FAA Safety and Design Standards.

The alternatives discussed in this chapter are listed below, depicted in the Figures located at the end of this Chapter, and are summarized in Table VI-6 with respect to estimated cost, meeting FAA Standards, meeting recommended runway lengths, potential environmental impacts, and other considerations.

Development Alternatives for San Carlos Apache Airport:

0) Maintain the airport as it presently exists. ("Do nothing" alternative)
1) Rehabilitate the existing Runway 9/27.
2) Rehabilitate the existing Runway 9/27; extend Runway 9/27 and Parallel Taxiway.
3) Construct a new runway which meets FAA guidelines for aircraft having an ARC of C-II.
4) Rehabilitate and extend the existing Runway 9/27; construct a new full length Parallel Taxiway with 300' Runway/Taxiway separation.
5) Develop a new airport site.
6) Provide service from another airport in the region.

TABLE VI-6
COMPARISON OF DEVELOPMENT ALTERNATIVES

DEVELOPMENT ALTERNATIVES					
Alternative	**Estimated Capital Cost**	FAA Standards Met	Recommended Runway Length Met	Potential Environmental Impacts	Other Considerations & Impacts
Alternative "0"	$0	N	N	N	4
Alternative "1"	$4,208,100	N	N	N	1
Alternative "2"	$5,926,500	N	Y	Y	N
Alternative "3"	$6,067,900	Y	Y	Y	N
Alternative "4"	$7,326,000	Y	Y	Y	2
Alternative "5"	$15,348,600	Y	Y	Y	3
Alternative "6"	$0	Y	Y	N	4

N=No Y=Yes
1 Extensive pavement maintenance required.
2 Apron and operational impacts.
3 Extensive financial and potential socioeconomic impact.
4 Unacceptable for meeting aviation needs of community.

6.9.1 Selection of the Proposed Action

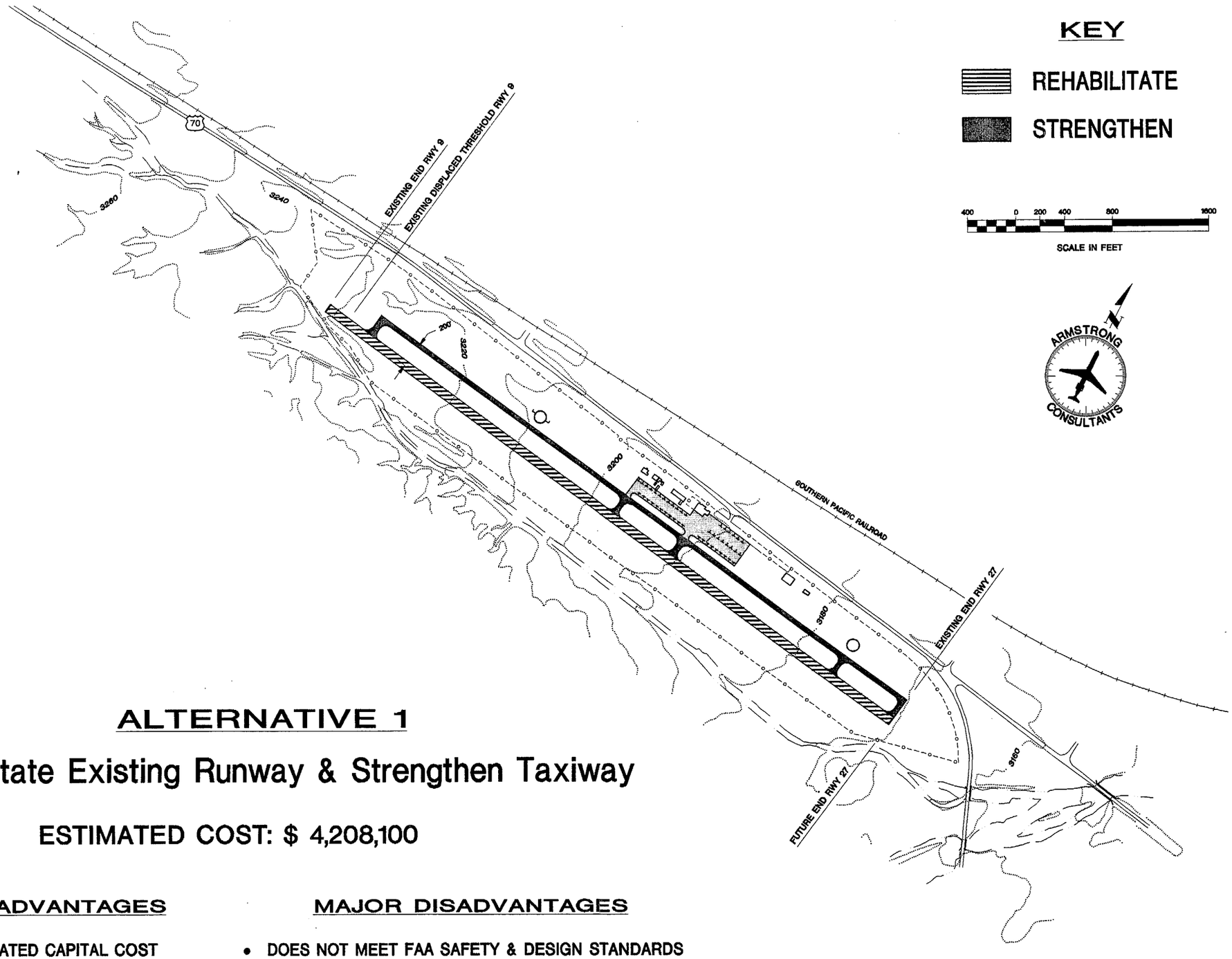
The proposed action selected for development of the San Carlos Apache Airport is **Alternative "3"**.

Alternatives "0", "1", and "2" do not meet the minimum requirements for both FAA Standards and recommended runway length, and were eliminated from further consideration. Alternative "5", while meeting FAA Standards, recommended runway length, and service to the greater Globe/Miami area, bears an excessive capital expense. This capital expense would create a severe economic burden on the sponsor, which could impact funding of other community needs and have a negative socioeconomic impact on the community. This alternative was eliminated from further consideration. Alternative "6" does not meet the goal of providing safe and efficient service to the aviation needs of Gila County and the greater Globe/Miami/San Carlos area and was eliminated from

providing safe and efficient service to the aviation needs of Gila County and the greater Globe/Miami/San Carlos area and was eliminated from further consideration.

The remaining alternatives, Alternative "3" and Alternative "4", provide an airport facility which meets FAA Standards, recommended runway length, and efficient service to the greater Globe/Miami/San Carlos area. Alternative "3", however, is slightly more cost effective and causes less impact to airport operations, airport facilities, and future airport development. Relocating the parallel taxiway 100' to the north in Alternative "4" eliminates approximately 5,000 square yards (S.Y.) of existing aircraft parking apron. Furthermore, the existing Runway 9/27 would still require an extensive rehabilitation. In Alternative "3", an extensive runway rehabilitation is avoided with the construction of a new runway, and the parallel taxiway as merely strengthened with an asphalt overlay. No apron or other facilities are impacted.

As a result of the analysis of the development alternatives, Alternative "3" was selected by the Sponsor as the proposed action. An Environmental Assessment has been accomplished for this alternative and is summarized in Chapter VII. A five-year Federal Capital Improvement Program (CIP) has been submitted to the FAA representing this alternative, and a 20 year CIP for this alternative, and related development, is included in Chapter VIII of this report.



KEY

REHABILITATE

STRENGTHEN

400 0 200 400 800 1600

SCALE IN FEET

ALTERNATIVE 1

Rehabilitate Existing Runway & Strengthen Taxiway

ESTIMATED COST: $ 4,208,100

MAJOR ADVANTAGES

- LOWEST ESTIMATED CAPITAL COST
- NO POTENTIAL ENVIRONMENTAL IMPACTS
- NO MAJOR CONSTRUCTION CHALLENGES

MAJOR DISADVANTAGES

- DOES NOT MEET FAA SAFETY & DESIGN STANDARDS
- DOES NOT MEET RECOMMENDED RUNWAY LENGTHS

FIGURE 6-1

NOTE: ALL COST ESTIMATES IN 1997 DOLLARS

ARMSTRONG CONSULTANTS, INC.
AIRPORT DESIGN & PLANNING
861 Rood Avenue
Grand Junction, CO 81501
970-242-1001

SAN CARLOS APACHE REGIONAL AIRPORT

Revisions:

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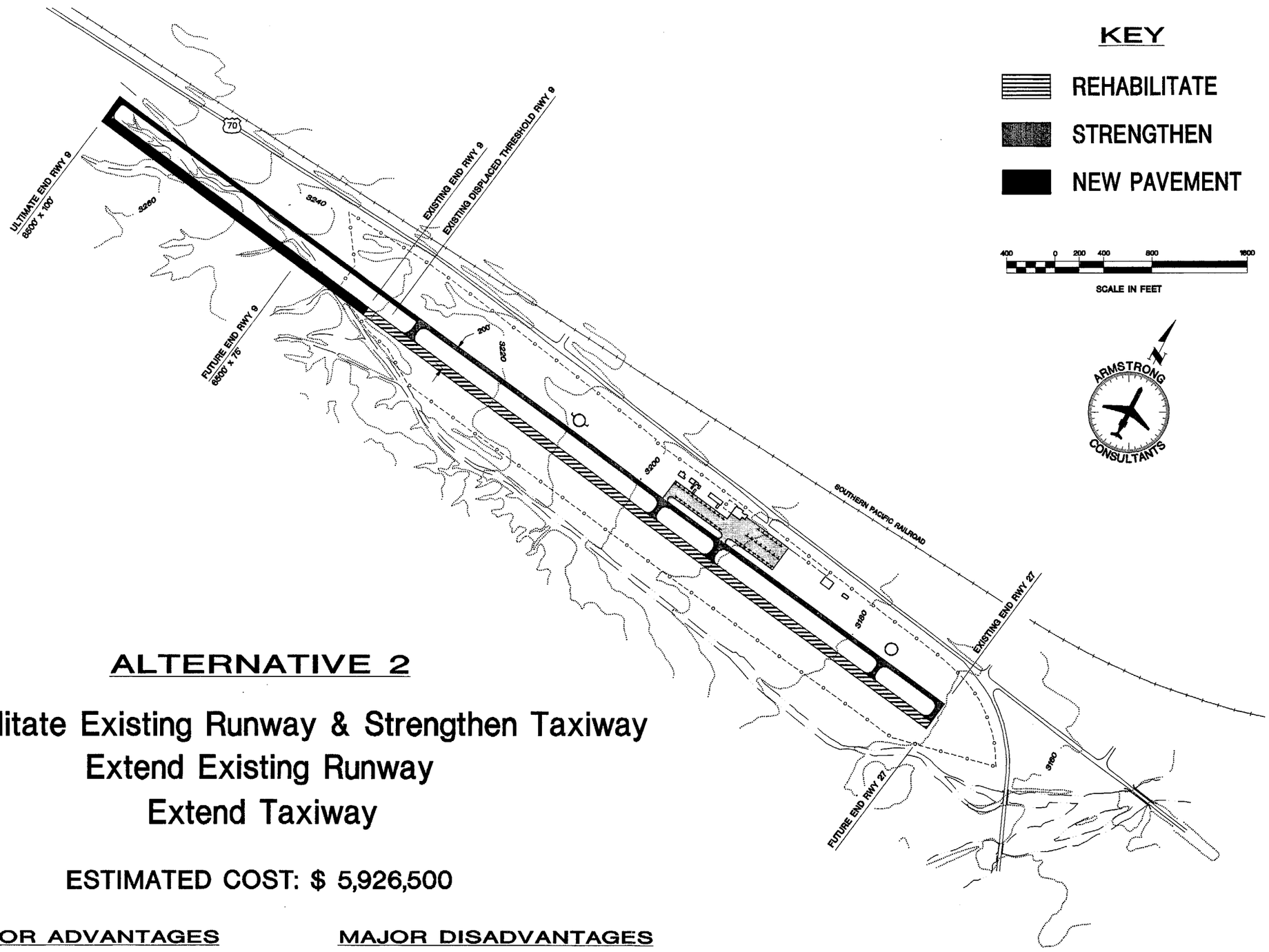
Date: 05/05/97
File Name: ALTER1

Drawn: KMS
Checked: DAC
Approved: EAA

Sheet: 1 of 4



KEY

- REHABILITATE
- STRENGTHEN
- NEW PAVEMENT

400 0 200 400 800 1600

SCALE IN FEET

ALTERNATIVE 2

Rehabilitate Existing Runway & Strengthen Taxiway
Extend Existing Runway
Extend Taxiway

ESTIMATED COST: $ 5,926,500

MAJOR ADVANTAGES

- MEETS RECOMMENDED RUNWAY LENGTHS

MAJOR DISADVANTAGES

- DOES NOT MEET FAA SAFETY OR DESIGN STANDARDS
- RELOCATION OF DRAINAGE WASH

FIGURE 6-2

NOTE: ALL COST ESTIMATES IN 1997 DOLLARS

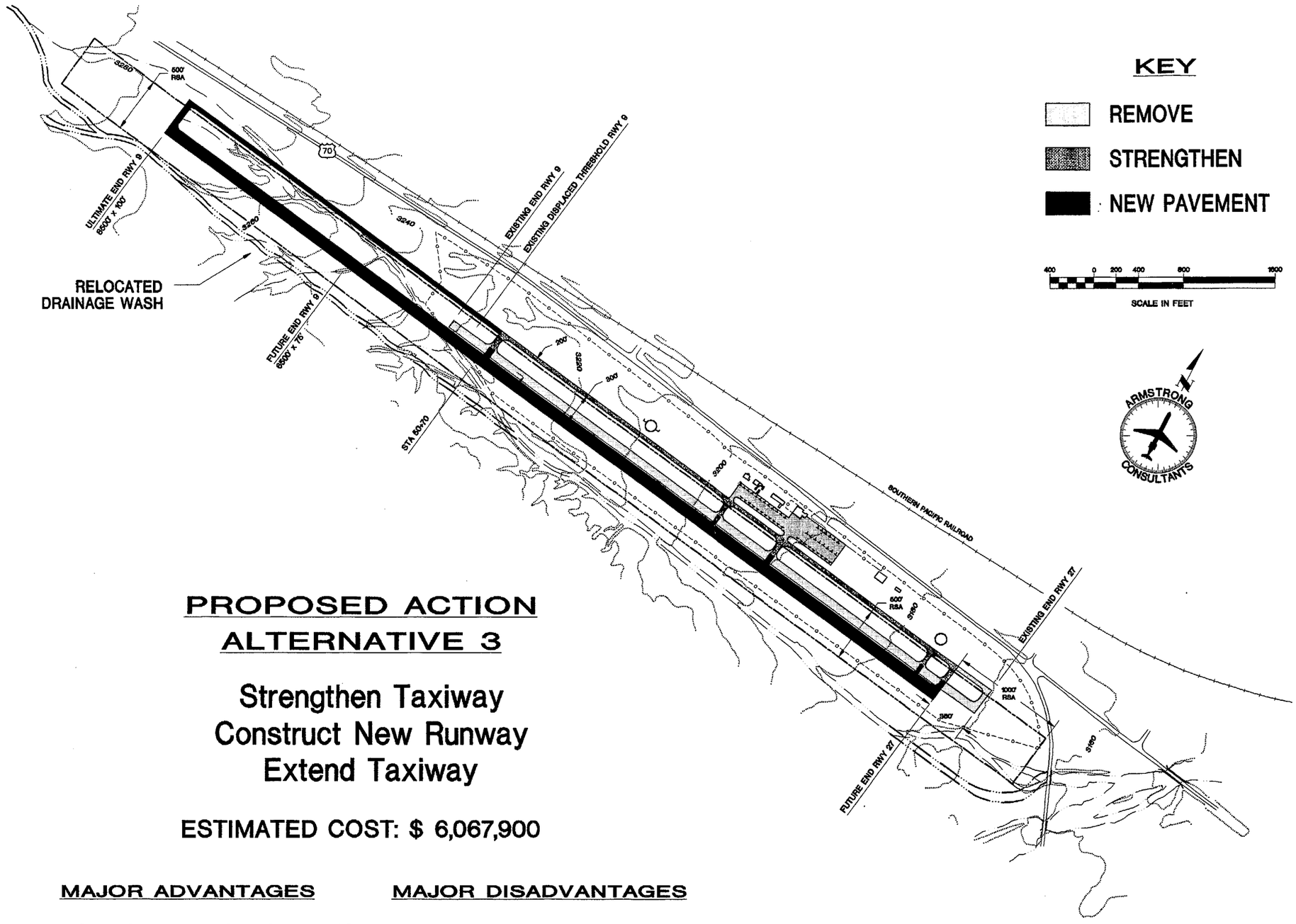
ARMSTRONG CONSULTANTS, INC.
AIRPORT DESIGN & PLANNING
861 Rood Avenue
Grand Junction, CO 81501
970-242-0101

SAN CARLOS APACHE REGIONAL AIRPORT

Revisions:

Project No: 965484
Date: 05/05/97
File Name: ALTER2

Drawn: KMS
Checked: DAC
Approved: EAA



KEY

- REMOVE
- STRENGTHEN
- NEW PAVEMENT

400 0 200 400 800 1600

SCALE IN FEET

PROPOSED ACTION
ALTERNATIVE 3

Strengthen Taxiway
Construct New Runway
Extend Taxiway

ESTIMATED COST: $ 6,067,900

MAJOR ADVANTAGES

- MEETS FAA SAFETY & DESIGN STANDARDS
- MEETS RECOMMENDED RUNWAY LENGTHS

MAJOR DISADVANTAGES

- RELOCATION OF DRAINAGE WASH

FIGURE 6-3

NOTE: ALL COST ESTIMATES IN 1997 DOLLARS

ARMSTRONG CONSULTANTS, INC.
AIRPORT DESIGN & PLANNING
861 Rood Avenue
Grand Junction, CO 81501
970-242-0561

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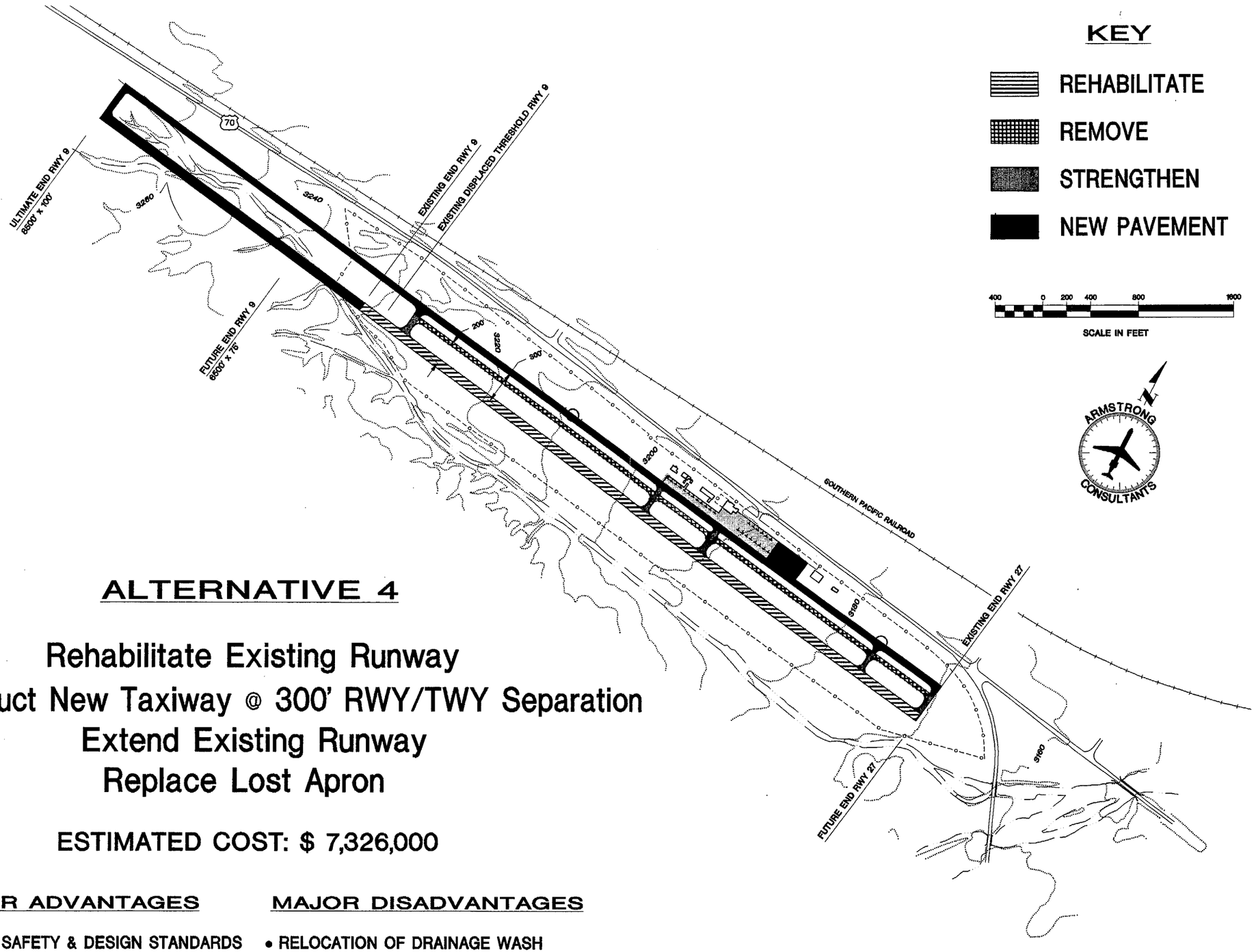
Approved: EAA



KEY

- REHABILITATE
- REMOVE
- STRENGTHEN
- NEW PAVEMENT

400 0 200 400 800 1600

SCALE IN FEET

ALTERNATIVE 4

Rehabilitate Existing Runway
Construct New Taxiway @ 300' RWY/TWY Separation
Extend Existing Runway
Replace Lost Apron

ESTIMATED COST: $ 7,326,000

MAJOR ADVANTAGES

- MEETS FAA SAFETY & DESIGN STANDARDS
- MEETS RECOMMENDED RUNWAY LENGTHS

MAJOR DISADVANTAGES

- RELOCATION OF DRAINAGE WASH
- ELIMINATES APPROXIMATELY 5,000 S.Y. OF EXISTING PARKING APRON
- LEAST COST EFFECTIVE

FIGURE 6-4

NOTE: ALL COST ESTIMATES IN 1997 DOLLARS

ARMSTRONG CONSULTANTS, INC.
AIRPORT DESIGN & PLANNING
861 Rood Avenue
Grand Junction, CO 81501
970-242-0101

SAN CARLOS APACHE REGIONAL AIRPORT

Revisions:

Project No: 965484
Date: 05/05/97
File Name: ALTER4

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Approved: EAA